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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/040,646 | 01/07/2002 | Hirohiko Nishiki | SLA 0452 | 2652 |

7590 09/17/2003

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EXAMINER

ALANKO, ANITA KAREN

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 09/17/2003

5

Please find below and/or attached an Office communication concerning this application or proceeding.

A5

| | | |
|------------------------------|-----------------|----------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/040,646 | NISHIKI ET AL. |
| | Examiner | Art Unit |
| | Anita K Alanko | 1765 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 8/5/03 election.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) 9-19 is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-8 and 20 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

| | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 . | 6) <input type="checkbox"/> Other: _____ |

Election/Restrictions

Applicant's election of Group I in Paper No. 4 (filed 8/5/03) is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2 are rejected under 35 U.S.C. 102(e) as being anticipated by Degendt et al (US 2002/0088478 A1).

Degendt discloses a method comprising:

forming an electrode layer (AlSiCu, Fig.1-2);

forming a resin residue overlying a first area of the electrode layer (Fig.1-2; page 1, paragraph [0008]; a resin residue of fluorocarbon polymer residues);

introducing a gas mixture including ozone into water to create a moist ozone gas (page 3, paragraph [0055]); and,

wet ashing the resin residue overlying the first area of the electrode layer using the moist ozone gas (so as to help prevent reliability concerns, page 1, lines 11+ of paragraph [0009]).

As to claim 2, Degendt discloses to form a resin (I-line resist) overlying the electrode layer (page 4, paragraph [0068]; patterning the resin interlayer (lines 8-11 of paragraph [0068]); forming a via to access the first area of the electrode layer (line 11 of paragraph [0068], the CF₄/CHF₃ plasma etch); and wherein forming the resin residue overlying the first area of the electrode layer includes forming the resin residue in response to forming the via (paragraph [0066], fluorocarbon polymer residue).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Degendt et al (US 2002/0088478 A1).

The discussion of Degendt from above is repeated here.

As to claim 4, Degendt discloses to use moist ozone gas, but does not disclose the concentration. It would have been obvious to one with ordinary skill in the art to use the concentration cited in order to optimize the process for best results since the concentration appears to reflect a result-effective variable which can be optimized. See MPEP 2144.05 II.B.

As to claim 5, Degendt discloses to heat to 80 °C (paragraph [0055]), but it would have been obvious to one with ordinary skill in the art to use the temperature cited in order to optimize the process for best results since the temperature appears to reflect a result-effective variable which can be optimized. See MPEP 2144.05 II.B.

Claims 1-8 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Degendt et al (US 2002/0088478 A1) and admitted prior art.

The discussion of Degendt from above is repeated here.

As to claims 3 and 20, admitted prior art teaches that pixel-on-passivation (POP) structures are known (page 1 of specification, lines 22+). Admitted prior art teaches that resin interlayers patterned by using a photoresist and etching (page 2, lines 1-10) are known and useful.

Admitted prior art fails to disclose to clean the vias before pixel electrode deposition. Degendt teaches a useful cleaning process after a via etching process using photoresist. Degendt teaches that the moist ozone gas process is useful for several different types of semiconductor devices, particularly after via etching ([0003], [0006], [0018]). Degendt teaches that the moist ozone gas process to remove residues is desirable in order to prevent reliability problems with subsequent metal deposition (paragraph [0009]).

It would have been obvious to one with ordinary skill in the art to use the method of Degendt to clean a POP structure including resin interlayer because Degendt teaches that cleaning is desirable to prevent reliability problems in etched vias with subsequent metal layers.

It would have been still further obvious to one with ordinary skill in the art to deposit the resin interlayer to the thickness cited because the thickness appears to reflect a result-effective variable which can be optimized. See MPEP 2144.05 II.B.

As to claims 6-7, admitted prior art teaches that pixel-on-passivation (POP) structures are known (page 1 of specification, lines 22+). Admitted prior art teaches that pixel electrodes of ITO or aluminum overlying molybdenum are also known (page 2, lines 21-23).

As to claim 8, Degendt does not disclose the ashing rate, however since the modified method of admitted prior art uses the same materials and method steps as the instant invention, the same ashing rate is expected.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art shows methods with ozone cleaning.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anita K Alanko whose telephone number is 703-305-7708. The examiner can normally be reached on Monday, Tuesday and Friday, 8:00 am-4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 703-305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Paper No. 5
Art Unit: 1765

Anita K. Alanko

Anita K Alanko
Primary Examiner
Art Unit 1765